

Amendment to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listings of Claims

Claims 1-14 (canceled)

Claim 15 (original): An apparatus for use in manufacturing a semiconductor device, comprising:

a reaction chamber comprising a casing, and a spin chuck disposed within said casing, said spin chuck being configured to support a semiconductor substrate and being rotatable, whereby a semiconductor substrate supported thereon can be rotated;

a gas supply unit connected to said reaction chamber, said gas supply unit supplying the reaction chamber with a process gas for removing unnecessary material from a semiconductor substrate mounted to the spin chuck in the reaction chamber;

a gas injection unit connecting said gas supply unit to said reaction chamber, said gas injection unit having at least one gas injection opening, each said at least one gas injection opening being oriented such that the gas injection unit injects the process gas, supplied by the gas supply unit, into the reaction chamber in a horizontal direction substantially parallel to the major upper surface of a semiconductor substrate mounted to the spin chuck in the reaction chamber, and

an exhaust unit connected to said reaction chamber so as to exhaust gases from the reaction chamber.

Claim 16 (original): The apparatus of claim 15, wherein said gas supply unit comprises a source of a fluorine-containing gaseous compound.

Claim 17 (original): The apparatus of claim 16, wherein the compound is a gas selected from the group consisting of CIF, CIF₃, BrF, BrF₃, BrF₅, IF, IF₃, IF₅ and XeF₂.

Claim 18 (original): The apparatus of claim 16, wherein said gas supply unit further comprises a source of a carrier gas.

Claim 19 (original): The apparatus of claim 15, wherein said gas injection unit is disposed on an inner side wall of said casing of the reaction chamber, and comprises a shower head having a plurality of gas injection openings through which the process gas flows into the reaction chamber in a horizontal direction above said spin chuck.

Claim 20 (original): The apparatus of claim 15, and further comprising a puff valve connected in-line between said gas supply unit and said reaction chamber, said puff valve being operative to supply the process gas flowing from the gas supply unit into the reaction chamber as a series of pulses of a predetermined period.